



Date: December 17, 2015

To: Kyle Taylor, Durham City County Planning Department
From: Bill Judge PE, City of Durham Department of Transportation
Subject: Westpoint at NC 751 Lot 6 (Z1500027) Traffic Impact Analysis

The Unified Development Ordinance (UDO) requires that a Traffic Impact Analysis (TIA) be prepared for proposed developments estimated to generate 150 or more peak-hour vehicle trips. The proposed development includes 100,000 square-feet of medical office and a 6,000 square-foot high-turnover sit-down restaurant. The development is expected to generate 304 a.m. peak-hour trips (225 entering and 79 exiting) and 350 p.m. peak-hour trips (116 entering and 234 exiting). The proposed development is located on the west side of NC 751, south of I-40.

The site will utilize an existing signalized driveway connection to NC 751 opposite Renaissance Parkway. The expected completion year is 2016, and the TIA analysis year is 2017. The Westpoint at NC 751 Lot 6 TIA was prepared by Ramey Kemp & Associates, Inc. in August 2015 with an Addendum in November 2015..

Study Area

The study area includes the following intersections:

- NC 751 and I-40 Westbound Ramp;
- NC 751 and I-40 Eastbound Ramp; and
- NC 751 and Renaissance Parkway / Site Driveway.

Trip Generation

Trip generation numbers are based on the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 9th Edition*, 2012. The TIA used the following ITE trip generation uses for the proposed development:

USE	SIZE	ITE CODE
Medical Office	100,000 square-feet	720
High-Turnover Sit-Down Restaurant	6,000 square-feet	932

These proposed uses will generate 304 a.m. peak-hour and 350 p.m. peak-hour trips. The p.m. peak-hour trips were adjusted utilizing published ITE rates to account for internal capture trips and pass-by trips. The final adjusted external trips for the proposed site resulted in 304 a.m. peak-hour and 306 p.m. peak-hour trips.

Traffic Data Collection

The peak-hour intersection turning movement counts were taken from 7-9 a.m. and 4-6 p.m. in July 2015.

Trip Distribution and Assignment

The assignment of site traffic on the study area roadway network was based on the following trip distribution percentages:

- To/From the East via I-40: 30% of site trips;
- To/From the West via I-40: 30% of site trips;
- To/From the North via NC 751: 10% of site trips;
- To/From the South via NC 751: 15% of site trips; and
- To/From the East via Renaissance Parkway: 15% of site trips.

Approved Developments and Background Growth

For background traffic growth rate, variable rates between 0% and 3% were applied to the existing traffic counts depending on traffic volumes at specific intersections. For those intersections where traffic growth, due to new approved developments, exceeded a 3% annual growth rate, no additional growth rate was applied for background traffic. For those intersections where traffic growth, due to approved developments, came just below a 3% annual growth rate, a variable growth rate was applied as needed to ensure that total growth rate would equal or exceed 3% per year as required by the City of Durham TIA guidelines. The TIA used traffic volume projections from the following approved developments:

- Westpoint at NC 751 Development: The unoccupied space in the existing adjacent Westpoint at NC 751 development. The vacant space includes 5,300 square-feet of office and 2,000 square-feet of retail;
- NC 751 South Mixed Use Development Phase 1: The proposed development is located on the west side of NC 751 south of Stagecoach Road. Phase 1 includes: 281 apartments, 185 single-family lots, 139 townhomes, and 52,000 square-feet of specialty retail.

TIP Roadway Improvements

There are no significant scheduled transportation improvement projects in the study area vicinity.

Capacity Analysis

Capacity analyses were performed using the a.m. and p.m. peak-hour for the following scenarios:

- Existing (2015) conditions;
- No-Build (2017) conditions (2015 Existing + Background growth traffic);
- Build (2017) conditions (2017 No-Build + Site traffic); and
- Build (2017) with improvements conditions (2017 Build + improvements).

This development and project study area are located within the Suburban Tier where the adopted LOS standard is LOS D. The following table summarizes the average delay for the various Levels of Service (LOS) for unsignalized and signalized intersections:

	Signalized Intersections	Unsignalized Intersections
Level of Service	Average Vehicle Delay (Seconds)	Average Vehicle Delay (Seconds)
A	0-10	0-10
B	10-20	10-15
C	20-35	15-25
D	35-55	25-35
E	55-80	35-50
F	>80	>50

NC 751 and I-40 Westbound Ramps

The following table summarizes the Levels of Service at this existing signalized intersection:

Scenario	a.m. LOS	p.m. LOS
Existing (2015)	C	C
No-Build (2017)	C	C
Build (2017)	C	C

With the additional site traffic, the intersection will operate at an acceptable LOS C for both the a.m. peak-hour and the p.m. peak-hour for the Build (2017) condition. No improvements are proposed or required at this intersection.

NC 751 and I-40 Eastbound Ramps

The following table summarizes the Levels of Service at this existing signalized intersection:

Scenario	a.m. LOS	p.m. LOS
Existing (2015)	B	C
No-Build (2017)	B	D
Build (2017)	B	D

With the additional site traffic, the intersection will operate at an acceptable LOS D or better for both the a.m. peak-hour and the p.m. peak-hour for the Build (2017) condition. No improvements are proposed or required at this intersection.

NC 751 and Renaissance Parkway / Site Driveway

The following table summarizes the Levels of Service at this existing signalized intersection:

Scenario	a.m. LOS	p.m. LOS
Existing (2015)	C	C
No-Build (2017)	C	D
Build (2017)	D	D

With the additional site traffic and a slight adjustment in signal timing to increase the green time on Renaissance Parkway and reduce the green time on the Site Driveway while maintaining the existing cycle lengths, the intersection will operate at an acceptable LOS D or better for both the a.m. peak-hour and the p.m. peak-hour for the Build (2017) condition. No roadway improvements are proposed or required at this intersection.

Summary of Required Improvements:

No roadway improvements are proposed or required within the study area to accommodate the additional site traffic.